

Gender Differences in the Relationship Between Education and Type II Diabetes Morbidity: Decomposing Change for Cohorts Born 1935-1954

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Introduction

Findings from past cross-sectional research on diabetes, gender, and education has found: First, there are **substantial gender disparities in type II diabetes prevalence**.¹ Second, there is a **strong linear and negative relationship between educational attainment and type II diabetes risk for both genders, but with a stronger effect for females than for males**.² Third, **gender disparities in educational attainments have reversed**. For example, the historical male advantage of 13.1 percentage points in completing a BA in 1960 had shifted to a female advantage of 7.2 percentage points by 2010.³

Past research has not, however, investigated how change in diabetes prevalence for both men and women may be linked to change in gender disparities in education. Previous studies have also not considered how gender differences in the association between educational attainment and diabetes may have changed over time and the implications this has had for gender disparities in diabetes. **My research examines how shifting diabetes prevalence for males and females are related to changing magnitude of the relationship linking education to diabetes and to changing educational attainments for cohorts born from 1935-1954.**

Data and Methods

Data 1997-2016 National Health Interview Survey⁴

Sample: Five-year cohorts ages 60-64 born between 1935 and 1954

Measures

Dependent Variable: Diagnosed with diabetes after age 15

Main Independent Variable: Educational attainment (4 categories)

Control Variables: Race-ethnicity, marital status, and region

Methods: Gender-Specific Analyses

Change in Effect of Education by Gender

Logit Regressions--Odds ratios for four 5-year cohorts

Change in Education Composition by Gender

Fairlie Decomposition—Comparing the earliest and latest cohorts

Results

Multivariate Analysis: *Expanding educational attainment and diabetes*

- Greater educational attainment for males than females in all cohorts.
- Later-born cohorts experience **narrowing educational attainment gender gap**.
- Greater diabetes prevalence for males than females in all cohorts.
- Later-born cohorts experience **slight narrowing of gender gap in diabetes**.
- Both genders: Diabetes prevalence increases by cohort for all education groups.
- Both genders: **Educational gap in diabetes seemingly greater** in later-born cohorts.
- Logit Models:** *Gender difference in relationship between education and diabetes narrows*
- The odds of being diagnosed with diabetes for **male college graduates increases from 49 to 56 percent lower** than for those with less than high school.
- The odds of being diagnosed with diabetes for **female college graduates declines from 75 to 65 percent lower** than for those with less than high school.

Fairlie Models: *Compositional effect of education on diabetes*

- Among the socio-demographic variables considered, changes in education composition had the largest effect on diabetes prevalence for both genders, although this **effect was negative and working against diabetes expansion**.
- If the 1935-39 cohort education levels had remained stable, diabetes prevalence **growth** would have been **one-third larger for the 1950-54 male cohort** (1.11 percentage points greater) and **one-half larger for the 1950-54 female cohort** (1.91 percentage points greater), controlling for other variables.

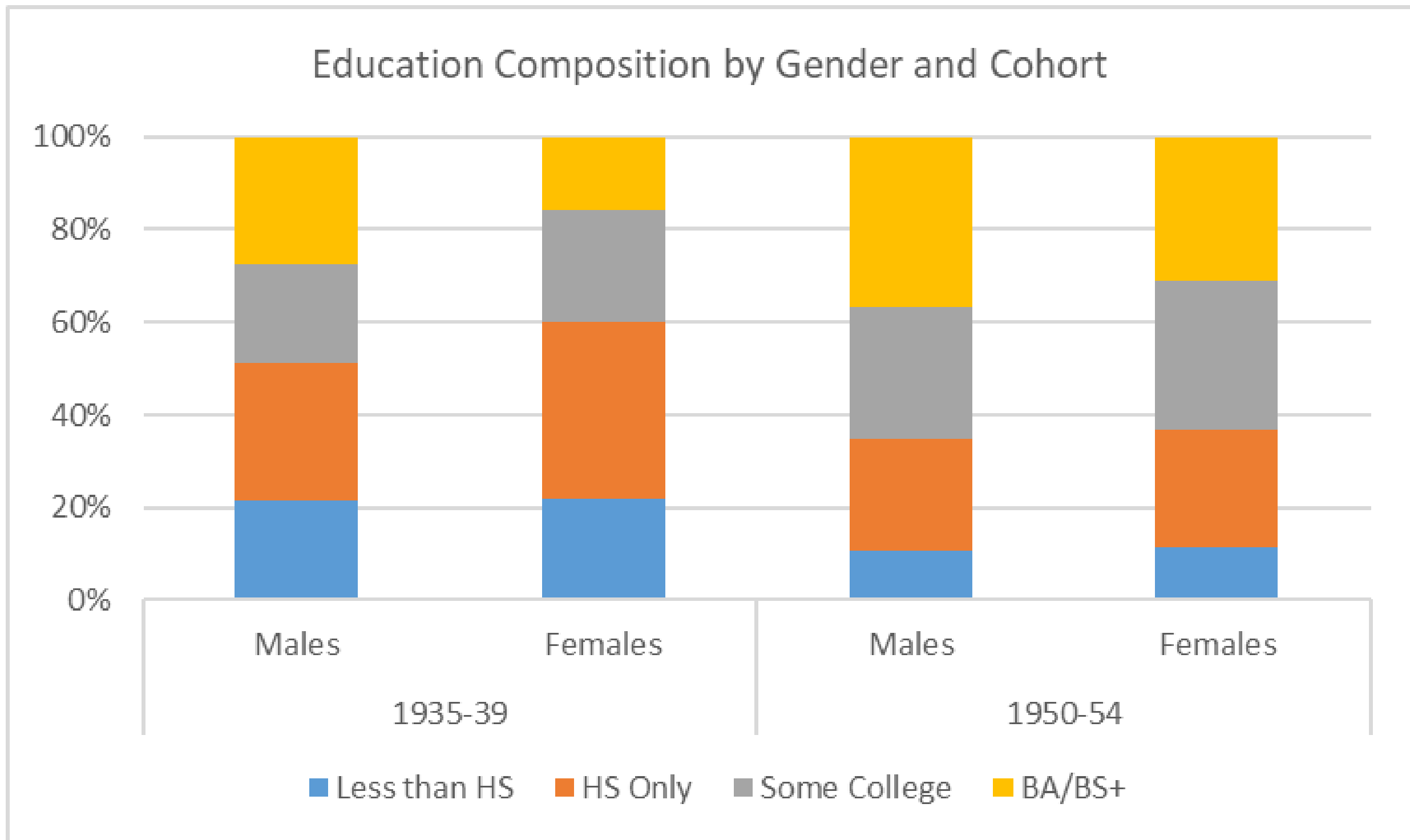


Table 1: Percentage-Point Increase in Education and Diabetes Across Cohorts by Gender (1935-1939 versus 1950-54)

	BA/BS			Diabetes Rate		
	1935-39	1950-54	Increase	1935-39	1950-54	Increase
Overall Sample	21.46%	33.87%	12.41%	12.64%	16.16%	3.52%
Gender						
Males	27.28%	36.64%	9.36%	13.88%	17.20%	3.32%
Females	15.65%	31.26%	15.61%	11.38%	15.18%	3.80%
Gender Gap (Male v. Female)	11.63%	5.38%		2.49%	2.02%	

Table 2: Weighted Logit Regression (Odds Ratios) for Diabetes Among Males and Females Aged 60-64 by Cohort

	1935-39	1940-44	1945-49	1950-54
	O.R.	O.R.	O.R.	O.R.
Males				
Less than High School (reference category)				
High School Only	0.74	0.80	0.73 *	0.73
Some College	0.64 **	1.03	0.70 *	0.68 *
Bachelors Degree or Higher	0.51 ***	0.53 ***	0.46 ***	0.44 ***
Constant	0.25 ***	0.19 ***	0.34 ***	0.30 ***
N	3,232	3,443	4,355	4,682
Pseudo R-squared	0.0209	0.0235	0.0205	0.0297
Females				
Less than High School (reference category)				
High School Only	0.75	0.74 *	0.78	0.72 *
Some College	0.67 *	0.66 **	0.73 *	0.59 ***
Bachelors Degree or Higher	0.25 ***	0.34 ***	0.37 ***	0.35 ***
Constant	0.15 ***	0.18 ***	0.22 ***	0.27 ***
N	3,783	4,093	4,956	5,549
Pseudo R-squared	0.0542	0.0476	0.0487	0.0520

***p<.001 **p<.01 *p<.05

Note: Logistic regression models include race-ethnicity, marital status, and region

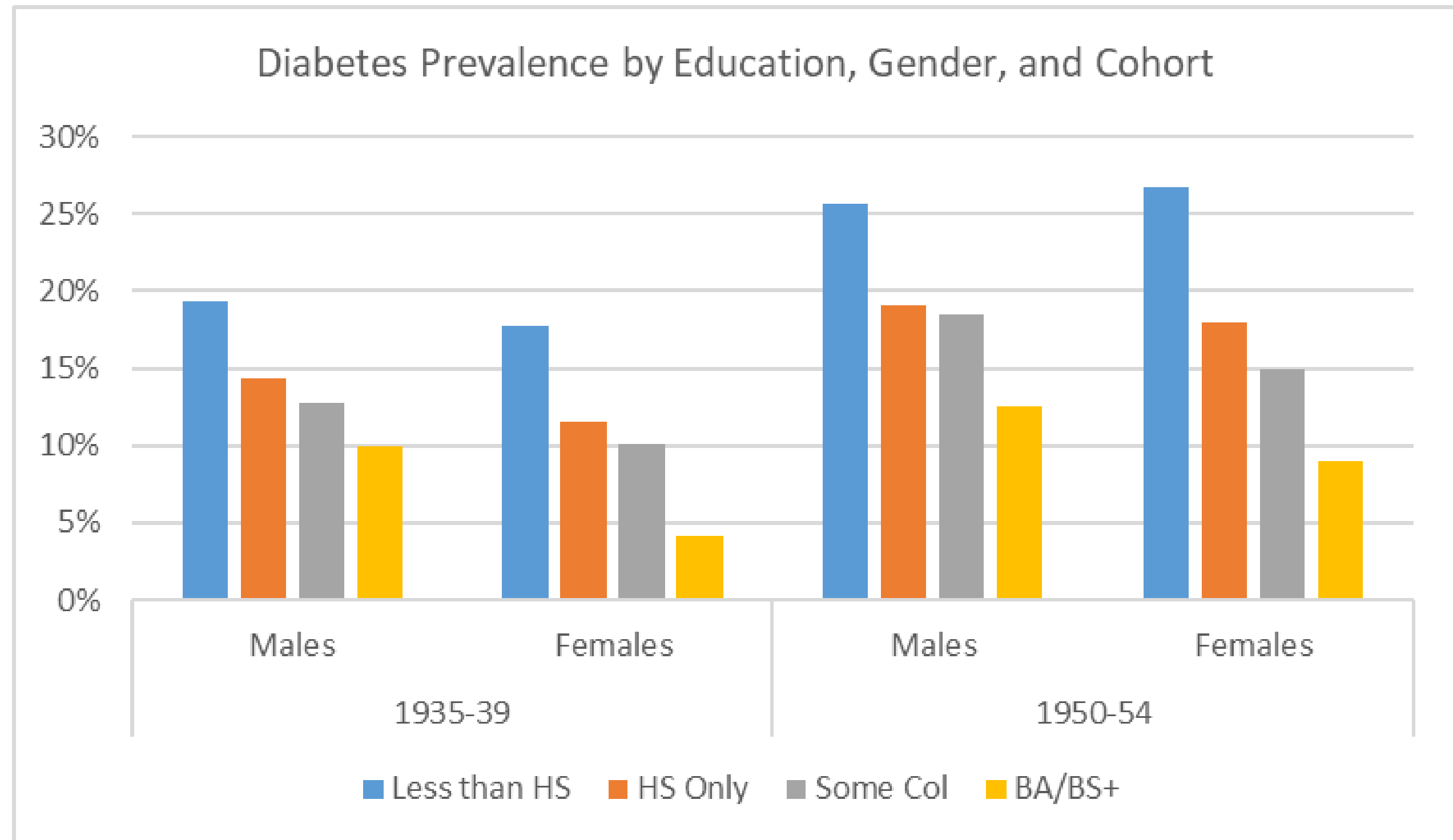


Table 3: Decomposition of Cohort Change in Diabetes Prevalence between 1935-39 and 1950-54 Cohorts by Gender

	Males		Females	
	1935-39 to 1950-54	1935-39 to 1950-54	1935-39 to 1950-54	1935-39 to 1950-54
Rates	13.88 to 17.20		11.38 to 15.18	
Percentage Point Change	3.32		3.80	
Pct. Pt. Disparity Explained	Effect	S.E.	Effect	S.E.
Educational Attainment	-1.11 ***	0.23	-1.91 ***	0.26
Race-Ethnicity	0.48 ***	0.12	0.84 ***	0.12
Marital Status	0.08	0.13	0.45 *	0.18
Region	-0.05	0.04	0.10	0.06
N	7,918		9,332	

***p<.001 **p<.01 *p<.05

Discussion and Future Research

The analyses confirm gender differences in the relationship between education and type II diabetes risk.² The findings add to the current literature by examining how **the effect of education on diabetes has changed** across cohorts for males and females, and by examining the **how diabetes prevalence has changed with** increasing education by gender and **the narrowing of the gender gap in education across cohorts**.

From the logit analysis, the female advantage in education's protective effect of having a BA grew smaller compared to females with less than high school, while the advantage for males increased.

From decomposition analysis, if later born cohorts had the education levels of previous cohorts (i.e., no education expansion), then diabetes prevalence would be even greater, especially for female cohorts. Namely, **educational expansion acted to limit diabetes growth for the U.S. population ages 60-64 born between 1935 and 1954 for both genders, with a greater compositional effect for women than men**.

Future, much-needed, research should focus on the mechanisms by which education influences diabetes.

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Erik Hernandez's results to this presentation were conducted at the Pennsylvania State University prior to his current employment at the U.S. Census Bureau. The views expressed on statistical and other issues are those of the author and not those of the U.S. Census Bureau. DRB NUMBER

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